

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 53047-48386	FOR FURTHER ACTION see Form PCT/ISA/220 as well as, where applicable, item 5 below.	
International application No. PCT/US2004/016021	International filing date (day/month/year) 21/05/2004	(Earliest) Priority Date (day/month/year) 07/04/2000
Applicant WASHINGTON UNIVERSITY		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 6 sheets.

☐ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ The international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

b. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2. ☐ **Certain claims were found unsearchable** (See Box II).

3. ☒ **Unity of invention is lacking** (see Box III).

4. With regard to the **title**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. With regard to the **drawings**,

a. the figure of the **drawings** to be published with the abstract is Figure No. 39a

☒ as suggested by the applicant.

☐ as selected by this Authority, because the applicant failed to suggest a figure.

☐ as selected by this Authority, because this figure better characterizes the invention.

b. ☐ none of the figures is to be published with the abstract.

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Box II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-23

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-23

securing the decryption step

2. claims: 24-44

search acceleration

INTERNATIONAL SEARCH REPORT



International Application No

PCT/US2004/016021

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 G06F1/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 G06F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 887 723 A (INTERNATIONAL BUSINESS MACHINES CORPORATION) 30 December 1998 (1998-12-30) abstract column 3, line 7 - column 8, line 18 figure 1	1-23
A	US 5 943 421 A (GRABON ET AL) 24 August 1999 (1999-08-24) abstract column 6, line 45 - line 63 column 7, line 48 - line 64 column 9, line 39 - line 50 figures 2,3b	4,11
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☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

° Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

6 April 2005

Date of mailing of the international search report

18. 08. 2005

Name and mailing address of the ISA

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Authorized officer

Segura, G

INTERNATIONAL SEARCH REPORT



national Application No

PCT/US2004/016021

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>EP 0 880 088 A (MITSUBISHI CORPORATION) 25 November 1998 (1998-11-25) column 14, line 2 - line 58 column 15, line 19 - line 31 column 8, line 41 - column 10, line 7 figures 2,3,5</p> <p>-----</p>	1-23

INTERNATIONAL SEARCH REPORT

Information on patent family members



International Application No

PCT/US2004/016021

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
EP 0887723	A	30-12-1998	US 6009171 A	28-12-1999
			CN 1337624 A ,C	27-02-2002
			CN 1205479 A ,C	20-01-1999
			EP 0887723 A2	30-12-1998
			HK 1042756 A1	22-04-2005
			JP 3053610 B2	19-06-2000
			JP 11088859 A	30-03-1999
			JP 2000124894 A	28-04-2000
			SG 77641 A1	16-01-2001
			TW 382092 B	11-02-2000

US 5943421	A	24-08-1999	US 6538413 B1	25-03-2003
			US 5898290 A	27-04-1999

EP 0880088	A	25-11-1998	JP 10326287 A	08-12-1998
			EP 0880088 A2	25-11-1998

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

see form PCT/ISA/220

PCT

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY
(PCT Rule 43bis.1)**

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.
PCT/US2004/016021

International filing date (day/month/year)
21.05.2004

Priority date (day/month/year)
07.04.2000

International Patent Classification (IPC) or both national classification and IPC
G06F1/00

Applicant
WASHINGTON UNIVERSITY

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☒ Box No. II Priority
- ☒ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☒ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA:



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**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
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Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
 - ☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material:
 - ☐ a sequence listing
 - ☐ table(s) related to the sequence listing
 - b. format of material:
 - ☐ in written format
 - ☐ in computer readable form
 - c. time of filing/furnishing:
 - ☐ contained in the international application as filed.
 - ☐ filed together with the international application in computer readable form.
 - ☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

Box No. II Priority

1. ☒ The validity of the priority claim has not been considered because the International Searching Authority does not have in its possession a copy of the earlier application whose priority has been claimed or, where required, a translation of that earlier application. This opinion has nevertheless been established on the assumption that the relevant date (Rules 43*bis*.1 and 64.1) is the claimed priority date.
2. ☐ This opinion has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid (Rules 43*bis*.1 and 64.1). Thus for the purposes of this opinion, the international filing date indicated above is considered to be the relevant date.
3. Additional observations, if necessary:

**WRITTEN OPINION OF THE
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Box No. III Non-establishment of opinion with regard to novelty, inventive step and Industrial applicability

The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non obvious), or to be industrially applicable have not been examined in respect of:

- ☐ the entire international application,
- ☒ claims Nos. 24-44

because:

- ☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (*specify*):
- ☐ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. are so unclear that no meaningful opinion could be formed (*specify*):
- ☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.
- ☒ no international search report has been established for the whole application or for said claims Nos. 24-44
- ☐ the nucleotide and/or amino acid sequence listing does not comply with the standard provided for in Annex C of the Administrative Instructions in that:
 - the written form ☐ has not been furnished
 - ☐ does not comply with the standard
 - the computer readable form ☐ has not been furnished
 - ☐ does not comply with the standard
- ☐ the tables related to the nucleotide and/or amino acid sequence listing, if in computer readable form only, do not comply with the technical requirements provided for in Annex C-bis of the Administrative Instructions.
- ☐ See separate sheet for further details

**WRITTEN OPINION OF THE
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Box No. IV Lack of unity of invention

1. ☒ In response to the invitation (Form PCT/ISA/206) to pay additional fees, the applicant has:
- ☐ paid additional fees.
 - ☐ paid additional fees under protest.
 - ☒ not paid additional fees.
2. ☐ This Authority found that the requirement of unity of invention is not complied with and chose not to invite the applicant to pay additional fees.
3. This Authority considers that the requirement of unity of invention in accordance with Rule 13.1, 13.2 and 13.3 is
- ☐ complied with
 - ☒ not complied with for the following reasons:
see separate sheet
4. Consequently, this report has been established in respect of the following parts of the international application:
- ☐ all parts.
 - ☒ the parts relating to claims Nos. 1-23

Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	20
	No: Claims	1,9
Inventive step (IS)	Yes: Claims	
	No: Claims	1,9,20
Industrial applicability (IA)	Yes: Claims	1,9,20
	No: Claims	

2. Citations and explanations

see separate sheet

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING
AUTHORITY (SEPARATE SHEET)**

International application No.

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Reference is made to the following documents:

- D1: EP-A-0 887 723 (INTERNATIONAL BUSINESS MACHINES CORPORATION) 30 December 1998 (1998-12-30)
D2: US-A-5 943 421 (GRABON ET AL) 24 August 1999 (1999-08-24)
D3: EP-A-0 880 088 (MITSUBISHI CORPORATION) 25 November 1998 (1998-11-25)

Re Item IV

Lack of unity of invention

This Authority considers that there are 2 inventions covered by the claims indicated as follows:

- I: Claims 1-23 Securing the decryption step.
II: Claims 24-44 Search acceleration.

The reasons for which the inventions are not so linked as to form a single general inventive concept, as required by Rule 13.1 PCT, are as follows:

The prior art has been identified as D1. This document discloses a method for securely sharing data with authorized parties, wherein the data to be shared is stored in a database ("external storage device", column 4, line 27) in a first encrypted format ("CSS encrypted original data", column 4, line 36), the method comprising: providing a programmable logic device ("central processing unit", column 4, lines 9-10) for connection to the database, wherein the programmable logic device is configured to receive a stream of encrypted data from the database ("received encrypted", column 4, line 21-22), decrypt the received encrypted data stream to create decrypted data ("descrambling", column 4, lines 20-21), and encrypt the decrypted data in a second encrypted format ("re-encrypted", column 4, lines 37-38); and sharing the data of the second encrypted format by communicating it to an authorized party ("transferred", column 5, lines 6-8).

From the comparison between D1 and the 1st invention (see claim 4), the features which are known from D1 are the following: a memory device in communication with the

programmable logic device ("memory 25", figure 1).

So that the following technical feature of claim 4 can be seen to make a contribution over the same prior art (in the sense of PCT Rule 13.2): the content of the memory device is accessible only by the programmable logic device and the programmable logic device is further configured to store at least a portion of the decrypted data in the memory device. From these Special Technical Features, the technical problem 1 to be solved may therefore be regarded as: how to secure the decryption step.

From the comparison between D1 and the 2nd invention (see claim 24), the features which are known from D1 are the following: a device for processing data received from a mass storage medium ("external storage device", column 4, line 27), the device comprising a programmable logic device ("central processing unit", column 4, lines 9-10) in communication with the mass storage medium comprising compressed data stored therein ("data compressed", column 3, line 24), the programmable logic device being configured to receive continuous stream of compressed data from the mass storage medium ("original data arrives", column 4, line 26), and decompress the received compressed data stream to create a stream of decompressed data ("decoding of a clear compressed video/data signal", column 6, lines 12-13).

So that the following technical features of claim 24 can be seen to make a contribution over the same prior art (in the sense of PCT Rule 13.2): perform a search operation within the stream of decompressed data. From these Special Technical Features, the technical problem 2 to be solved may therefore be regarded as: how to perform a high speed search.

The above analysis shows that claimed invention 1 and invention 2 do not have same Special Technical Features as required by PCT Rule 13.2.

Moreover, the technical problems are not the same and therefore the comparison between the claimed inventions does not show any corresponding Special Technical Feature. Therefore there is no technical relationship among the 2 inventions involving one or more of the same or corresponding special technical features. As a result, claimed invention 1 and invention 2 fail to demonstrate a single general inventive concept as required by PCT Rule 13.1.

Re Item V

**Reasoned statement with regard to novelty, inventive step or industrial applicability;
citations and explanations supporting such statement**

1. The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claims 1 and 9 is not new in the sense of Article 33(2) PCT.

- 1.1 The document D1 discloses (the references in parentheses applying to this document):

A method for securely sharing data with authorized parties, wherein the data to be shared is stored in a database ("external storage device", column 4, line 27) in a first encrypted format ("CSS encrypted original data", column 4, line 36), the method comprising: providing a programmable logic device ("central processing unit", column 4, lines 9-10) for connection to the database, wherein the programmable logic device is configured to receive a stream of encrypted data from the database ("received encrypted", column 4, line 21-22), decrypt the received encrypted data stream to create decrypted data ("descrambling", column 4, lines 20-21), and encrypt the decrypted data in a second encrypted format ("re-encrypted", column 4, lines 37-38); and sharing the data of the second encrypted format by communicating it to an authorized party ("transferred", column 5, lines 6-8).

Hence, document D1 discloses all the technical features of claim 1 and therefore claim 1 lacks novelty.

- 1.2 The same reasoning applies, mutatis mutandis, to the subject-matter of the corresponding independent claim 9 (device), which therefore is also considered not new.
2. The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 20 does not involve an inventive step in the sense of Article 33(3) PCT, for the following reasons:

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INTERNATIONAL SEARCHING
AUTHORITY (SEPARATE SHEET)**

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The subject matter of independent claim 20 differs from this known D1 in that it provides a reconfigurable logic device and the second encrypted format is delivered to **a requester**. Both features are juxtaposed and merely represent design choices so that claim 20 lacks an inventive step.

3. Dependent claims 2-8, 10-19 and 21-23 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty and/or inventive step, see documents D1-D3 and the corresponding passages cited in the search report.